

CLAIMS

What is claimed is:

1. A droplet discharging apparatus comprising:

means for discharging a discharge liquid in the form of droplets through an aperture by mechanically deforming a piezoelectric element by a normal drive signal, and

wherein the piezoelectric element is subjected to a heating drive signal of a repetitive frequency in an ultrasonic band, the heating drive signal being insufficient to cause droplets from being discharged through the aperture thereby facilitating heating of the droplets.

2. The droplet discharging apparatus according to Claim 1, wherein the heating drive signal is applied to the piezoelectric element immediately before a droplet is discharged by the normal drive signal.

3. The droplet discharging apparatus according to Claim 1, wherein the heating drive signal is applied to the piezoelectric element while a droplet is being discharged by the normal drive signal.

4. The droplet discharging apparatus according to Claim 1, wherein the heating drive signal is applied to the piezoelectric element if the temperature of a discharge liquid that is detected by a temperature detecting means drops below a predetermined threshold temperature.

5. The droplet discharging apparatus according to Claim 1, wherein the repetitive frequency of the heating drive signal is 40 kHz or more.

6. The droplet discharging apparatus according to Claim 1, wherein the amplitude of the heating drive signal is half that or less of the normal drive signal.

7. The droplet discharging apparatus according Claim1, wherein the discharge liquid is a printing ink.

8. The droplet discharging apparatus according to Claim 1, wherein the discharge liquid is an electrically conductive material for forming a wiring pattern.

9. The droplet discharging apparatus according Claim 1, wherein the discharge liquid is a transparent resin for forming a microlens.

10. The droplet discharging apparatus according to Claim 1, wherein the discharge liquid is a resin for forming a color layer of a color filter.

11. The droplet discharging apparatus according to Claim 1, wherein the discharge liquid is an electro-optic material.

12. The droplet discharging apparatus according to Claim 11, wherein the electro-optic material is a fluorescent organic compound presenting electroluminescence.

13. The droplet discharging apparatus according to Claim 12, wherein the heating drive signal is applied to the piezoelectric element before, during and after preliminary discharging (flushing).

14. A droplet discharging method comprising:

discharging a discharge liquid in the form of droplets through an aperture by mechanically deforming a piezoelectric element by a normal drive signal, and

wherein the discharge liquid is heated by subjecting the piezoelectric element to heating drive signal at a repetitive frequency in an ultrasonic band, the heating drive signal being insufficient to cause the discharge liquid from being discharged through the aperture thereby facilitating heating of the droplets.

15. The droplet discharging method according to Claim 14, wherein the heating drive is carried out immediately before the normal drive for discharging a droplet.

16. The droplet discharging method according to Claim 14, wherein the heating drive is carried out during the normal drive.

17. The droplet discharging method according to Claim 14, wherein the heating drive is carried out if the temperature of a discharge liquid drops below a predetermined threshold temperature.

18. The droplet discharging method according to Claim 14, wherein the repetitive frequency of the heating drive is 40 kHz or more.

19. The droplet discharging method according to Claim 14, wherein the heating drive is carried out at an amplitude that is half that or less of the normal drive.

20. The droplet discharging method according to Claim 14, wherein the discharge liquid is a printing ink.

21. The droplet discharging method according to Claim 14, wherein the discharge liquid is an electrically conductive material for forming a wiring pattern.

22. The droplet discharging method according to Claim 14, wherein the discharge liquid is a transparent resin for forming a microlens.

23. The droplet discharging method according to Claim 14, wherein the discharge liquid is a resin for forming a color layer of a color filter.

24. The droplet discharging method according to Claim 14, wherein the discharge liquid is an electro-optic material.

25. The droplet discharging method according to Claim 24, wherein the electro-optic material is a fluorescent organic compound presenting electroluminescence.

26. The droplet discharging method according to Claim 14, wherein the heating drive signal is applied to the piezoelectric element before, during and after preliminary discharging (flushing).